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ABSTRACT

This study examined the learning/behavioral patterns of children exposed to drugs and those not exposed during a math lesson. Data were collected concerning four male second graders (three white students and one black student) and their teachers. All of the students were classified as having severe behavioral handicaps. Two of the students had been exposed to crack/cocaine at birth, and the other two students had not been exposed to drugs. Teacher expectations as well as students' behaviors were addressed in the study design. The data permitted a detailed qualitative analysis of a classroom setting. Data from formal and informal observation sessions, audiotaped teacher interviews, and videotaped sessions of classroom interactions suggest that there are no observable differences in the learning/behavior patterns of children exposed to drugs when compared to those not exposed to drugs. These results support the need for further research concerning teacher-student interaction in the classroom setting. Examination of special teacher preparation for dealing with children exposed to drugs is suggested. (TJH)

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Observation of Children Exposed to Crack/Cocaine and
Children Nonexposed During a Functional
Math Lesson

A Paper Presented at the 12th Annual Meeting of the
Mid-Western Educational Research Association,
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Abstract

This study examined the learning/behavioral patterns of children exposed to drugs and those that are not exposed during a math lesson. Data was collected on 4 male subjects in Grades 1-3. Data collected during the project permitted a detailed qualitative analysis of a classroom setting. Data from observations, audio taped teacher interviews, and videotaped sessions of classroom interactions suggest there are no observable differences in the learning/behavior patterns of children exposed to drugs and those not exposed. These results are interpreted as support for further research of teacher-student interaction in a classroom setting.

STATEMENT OF THE PROBLEM

The focus of this presentation will be to discuss findings from an ethnological study with primary level children in a severe handicap classroom during a functional math lesson. Two children were exposed to crack/cocaine perinatally, while two were not. The long term needs of children perinatally exposed to drugs have yet to be determined through comprehensive research (Chasnoff, 1989).

The Ohio Task Force (1990) reports that the use of crack/cocaine profoundly and adversely affects the function of families as no other drugs. In the 1980's there has been an increase in the use of cocaine for all socioeconomic classes, races, ages, and sexes. (Gold's study cited in Van Dyke and Fox, 1990). Cocaine now surpasses heroin as American's leading street drug (Tarr & Macklin, 1987).

The notion that children exposed to crack/cocaine will experience academic difficulties once they reach school age, presupposes these children are at risk for learning problems and may show decreased problem solving strategies.

This study investigated whether there are observable differences in two children exposed to crack/cocaine at birth and two children nonexposed during a functional math lesson. The most troublesome issue is the body of data that implies children exposed to crack/cocaine will experience learning disabilities. Chasnoff (1989) suggests the nation's educational system should prepare for the special needs of increasing numbers of children

who, because their mothers used illicit drugs during pregnancy, will have difficulty learning in traditional school settings.

Chasnoff (1989) revealed in a two-year follow up study of 263 children who were evaluated at a treatment clinic for substance abusing pregnant women the following data (a) the drug-exposed two-year-olds score poorest on developmental tests that measure abilities to concentrate, interact with others in groups and cope with an unstructured environment and (b) the drug-exposed children scored within the normal range for cognitive development. Furthermore, many of these children ended up in special education or classes for the learning disabled.

Dolgin, Myers, Flynn & Moore (1984) maintain a learning disability is not easy to pin down or define. It can include a wide assortment of deficits and characteristics, ranging from the specific skills necessary for reading or spelling or calculating to a collection of maladaptive behaviors such as hyperactivity, impulsivity, distractibility, and poor concentration. Children who are truly learning disabled tend to exhibit a great variability in their performance from task to task, or in the way they handle the same task from day to day. Some children with learning disabilities appear to progress quite normally through their early development (Dolgin et al., 1984).

There are indications from the data to suggest a possible connection between learning disabilities and cognition. According to Lerner (1976) a disturbance in the thinking process no doubt is an important factor for many children with learning

disabilities. Further, a disturbance or inadequate development in other areas of learning is likely to affect adversely the development of the higher cognitive abilities. In addition, arithmetic and reading are basic school subjects that children with learning disabilities frequently fail, and these subjects represent two sectors of cognitive functioning-nonverbal and verbal (Lerner, 1976).

Whitin, Mills, & O'Keefe (1990) contend mathematics, like language development, is essentially a process of construction, not acquisition. Learning mathematics involves learning how to use mathematics in one's social world to meet one's particular purposes and intentions. The focus of attention should always be on the meaning that is being communicated rather than on the form of the mathematics itself. Mathematics is not an act but an event, an experience. Its purposes are not divorced from the lives of children but emanate from the intentions of the children themselves (Whitin et al., 1990).

Eicholz et al., (1985) suggest that demonstration and practice provide students with a thorough understanding of the concept of trading in readiness for adding 2-digit numbers with trading. Students learn to discern which problems require trading and which do not before proceeding to adding two 2-digit numbers with trading.

Children exposed to crack/cocaine are now reaching school age. One of the nation's first special education pilot programs developed a special curriculum for crack babies at the preschool

level. Development is an internal process in which the child is consistently organizing and reorganizing experiences within a continuum of stages. Movement through the stages is not an automatic passive activity. From birth a child who has not been exposed to drug/alcohol has the potential to attend and respond to selected stimuli and take the initiative to explore and control the environment (Cole, Ferrara, Garcia, Johnson, Jones, Blankett Schoenbaum, Tyler & Wallace, 1990). The purpose of this study is to determine whether there are differences in the behavioral/learning patterns of children exposed to drugs and those not exposed during a math lesson conducted by the same teacher.

In the analysis of this study the researcher will examine three primary questions:

1. What are the teachers' expectations of the children during math instruction?
2. Are the behaviors (conduct) of the children exposed to drugs different from children nonexposed to drugs?
3. What are the learning behaviors of the children during a math lessons?

METHOD

This study was conducted in a predominantly black, low-income urban school setting, Grades 1-3. Pupil enrollment consist of 318 students. The site chosen is one of 60 elementary

schools in the district. Teacher classification for the building include 9 regular teachers, 3 kindergarten and 5 special education teachers.

School Population Data

The school employs a population of special resource teaching personnel that include, 2 administrative, supervisory and personnel staff, 10 instructional assistants and 4 volunteers. Percentage breakdown of teachers by race/sex, black 36.4%, white 63.6%, female 9.1%; administrators, black 50%, white 50%, female 50%, and male 50%. Student statistics include Black/American 302, Asian American 0, Hispanics 0, White/all other 16. By sex there are 140 girls, and 178 boys. Average daily attendance 300, student mobility 57.9%, percent low-income 100%.

In this setting, severe behavior handicap (SBH) students receive instruction from a special education teacher for all the basic subjects (e.g. reading, math, and science), as well as for music, art and social studies. The children are mainstreamed daily for library.

The children arrive by school bus between 8:00 and 8:30 a.m. Upon arriving to the classroom each child is requested to be seated until names are called individually to hang coats. The day begins with sharing time, at this point the students can discuss a variety of topics, or plan individual goals for the week. The morning activity starts with the teacher asking a lead in question (e.g., how is the weather outside?). The teacher then writes the news or weather oral responses from the children

on the chalkboard. The children then copy the written material from the chalkboard on paper.

The students are arranged according to ability level for math instruction. Slower students work one-to-one with a teacher aide, in pairs, or small groups, while children at or above grade level work in groups aided by the teacher.

Teacher

The teacher is asked to share perspectives on the climate of the classroom and experiences as a special education teacher in a severe behavior handicap classroom. At the time of this study, the teacher was a second year teacher with one female aide assigned as classroom support. Interviews are conducted in the classroom with teacher accounts tape recorded for two sessions on separate days each for 20 minutes. According to the teacher, the students enjoy math instruction, and are eager to spend free time completing additional math problems.

Students

Involved in this study were 4 male subjects in the second grade classified as severe behavior handicap. Three of the male subjects are white and one black. Two of the students had been exposed to crack/cocaine at birth. According to information provided by the teacher, the first child tested positive for cocaine exposure at birth. The second child also tested positive for cocaine exposure and spent the first 6 months after birth in a detoxification center suffering from withdrawal symptoms from cocaine exposure. Both children were monitored by a psychologist

in a diagnostic facility, were then tested and finally placed in an appropriate special education classroom. One of the children spent 6-10 weeks for observation in the facility, while the other child spent 12 weeks in the facility. This is twice the normal span of time for most children.

There were two other children that participated in the study that were not exposed to drugs. Both children showed signs of inappropriate socialization skills with peers in addition to behavior problems, nonetheless these children achieve at or above level in math and reading skills.

Procedure

To obtain information about the instructional environment and the day-to-day schedule of classroom activities, 10 observations were constructed emphasizing qualitative data collection methods. Data was collected through informal and formal classroom observations, interviews, and audio and videotaped sessions. The data was collected by one observer functioning as participant observer. An average of 3 days each week was spent in the school over a 5-month period. During initial observations in September data was collected focusing on census, map, and physical patterns of the site. The first few weeks were set aside to survey the school setting, the beginning of a school day, daily routines, and teacher-student interactions. In addition, the locality of the principal's office and the principal's accessibility to staff and students was noted. Of added importance is the availability of school

services, emergency information, attendance, homework policies, and discipline codes.

Next, interviews were audio taped for two days during a 30-minute period. The interviews provide the teachers' account of classroom structure. The teacher was asked to explain components of the classroom environment (a) by describing a typical day in the classroom (b) by discussing the process of assigning students to the special education program (c) by discussing the agenda once the children enter the classroom (d) by assessing the daily routines of the children and (e) by describing classroom rules and expectations' for students.

Students were videotaped for 2-3 sessions over a two month period for 20 minutes during math lessons. Videotapes are studied to observe the childrens' patterns of behavior. Two significant videotapes of the children during group math activity were compared. The videotapes characterize learning behaviors and whether noticeable differences occurred on each day of videotaping. Data was analyzed to determine the student's ability to follow classroom rules prior to the instruction of lessons and the teachers' input and presentation of lessons.

The objectives of the lesson was to (a) add 2-digit numbers without renaming (b) add two or three 2-digit numbers with renaming and (c) solve problems using cumulative computational skills. Math worksheets from the Addison-Wesley math series were distributed beforehand. Students were encouraged to work with each other in addition to completing independent seatwork

assignments.

RESULTS

Data from observations, videotapes, and interviews are discussed to present a depiction of this SBH classroom. In each description, focal points are provided that highlight the teachers' role as teacher and the students' functional abilities during classroom activity.

School services incorporate health services, a school psychologist that visits once every two weeks to assist the teachers in meeting special needs of students, a speech therapist, three teachers and three instructional assistants to assist the children who have experienced difficulty in reading, a visiting teacher twice a week to serve as a link between home and school, a guidance counselor that provides individual small group and classroom counseling with students dealing with feelings, values, strengths and personal problems.

The school adopts a philosophy to provide an atmosphere conducive to learning, and high standards of discipline. The principal's handbook is described as "required reading for parents." The handbook communicates to parents the schools expectations concerning appropriate student behavior and a breakdown of consequences. Consequences are part of an Assertive Discipline Plan and can be a positive or negative consequence. A positive consequence will result in special notes, certificates, smilegrams, etc., a negative consequence would be name on chalkboard, receive one check mark=denied recess.

The Alternative Education Class (AEC) is an alternative to standard suspension. Assigning a student to AEC provides the school an opportunity to administer effective discipline while allowing the student to pay the penalty without additional interruption to his/her educational program.

Interview with Teacher

The children use yellow bus service and have an option. The children walk to the lunchroom for breakfast and are picked up by the teacher at 8:30. Once in the classroom the children are seated and then permitted to hang their coats one at a time. The students are then allowed washroom privileges. Classroom rules emphasize that students must earn washroom privileges. The students earn daily points for good behavior, the teacher and students review bonus points from the previous day. After lunch the children can spend free time watching Sesame Street. In the afternoon the children are instructed in science or health in whole groups. A late afternoon break of 20 minutes is allowed for free time before leaving.

The children in the SBH program must be tested before placement. There is also a developmentally handicapped (DH), and mentally handicapped (MH) program in the school. Children in either of these programs usually remain throughout the school year once placed. These children, according to the teacher have handicaps that persist. Most of these children will need additional school intervention.

What takes place during the day depends on the mood of the

students. For instance, the student's names are written on the chalkboard for inappropriate behavior. Children receive a treat for good behavior and can earn bonus points or stickers. As a behavioral approach, the teacher discovered by chance a method to urge the students to remain seated. While playing Simon Says with the students, the teacher observed that the students were seated and not conscious of being seated. One student in the class experiences problems remaining seated. The student is allowed, most of the time to walk around the classroom. However, if encounters with other students are noted, the teacher emphatically insists the student be seated.

The school district adopts a traditional SBH program that grants students an agenda for activities such as personal and classroom business. The children in this study are not currently participating in the school's traditional program. The teacher believes the students need adjustment time in addition to teacher direction before endeavoring new adventures.

The children show lots of enthusiasm for bonus points earned. Points can be used for box cars that are added to student's train sets. To earn box cars a student needs 1500 points. As an incentive the students can earn 25 points daily that are independent of the 1500 points designated by the school. Determination of points depend on the number of times the student's names are written on the chalkboard. The students, according to the teacher understand tangible items as opposed to intangibles. For example, placing the students' name on the

board and removing one letter at a time is more appropriate than using abstract concepts students cannot see or understand. If one child strikes another child and the other child does not respond, a letter is replaced as encouragement.

Classroom rules are clearly posted and visible. Time out methods are utilized when other procedures are not workable. The student is placed in an isolated section of the classroom and cannot observe classroom activities. An egg timer indicates the amount of time the student has to remain in isolation. Instead of the student constantly asking how much time is left, the egg timer serves as a timing device. When the allotted time has elapsed the student is allowed to rejoin the class. Another teacher approach used is counting from one to five, by the time the teacher reaches the number five and the students are not seated the student's name is written on the chalkboard.

Students reading and math levels vary in this classroom, therefore small groups are assembled to compensate for individual differences. Breakdown by groups for math instruction classify six students at or above grade level and three students below grade level. Students receive different task for each group. Students achieving at or above grade level receive higher level tasks. Worksheets are used that include two digit addition or subtraction problems with renaming. There are in addition two word problems that ask students to read a short paragraph and find a solution. The students are not currently required to complete word problems.

Students in smaller groups complete less difficult worksheets. Addition and subtraction with one digit numbers without renaming is emphasized. Smaller groups work with a teacher aide. The task of the students' in smaller groups is to fill in blanks with numbers and to memorize number facts.

Beforehand, the teacher permits students 10 minutes for a pre-activity exercise, at this time students must complete math worksheets individually. After 10 minutes, the first problem is written on the chalkboard. Classroom rules require students to remain seated during lessons. The students are quiet and attentive while the teacher explains the problem. The student's responses are acknowledged after hands are raised and the teacher recognizes the student by name. Students bouncing in and out of seats are reminded of classroom rules. The teacher then proceeds by writing the second problem on the board and calling one student by name to answer the problem. Answering out of turn temporarily discontinues the lesson until all students are quiet. Excessive disorder requires students to place heads on the desk and the lights are turned off.

The lesson resumes when students are silent and attentive. To test the students reasoning proficiency, the teacher asks (e.g. $6-2$) can 6 be subtracted from 2; a yes response prompts the teacher to hold up 2 fingers and ask the students verbally, how is it possible to subtract 6 from 2 if you only have two fingers?

The teacher disclosed most of the students at the beginning

of the school year did not know numbers and were unable to count. As a result of the student's inability to understand plus or minus procedures, the teacher developed a strategy using the number line. A number line strip was taped to each student's desk. Whenever a math lesson was taught, the teacher referred the students to the number line. A small figurine is placed on top of numbers and the students are then instructed to move the figure forward or backward indicating an increase or decrease operation. Each student is also supplied with a 12 inch wooden ruler that is carried to the chalkboard to solve problems.

Comparing Lessons

Two videotapes of separate math lessons are compared to observe patterns of learning/behavior. In the analyses of the videotapes on two separate days the following was disclosed (a) the teacher used addition or subtraction problems on either day e.g., the teacher would ask, how long does it take to get ready for school?--get dressed 21 minutes, eat breakfast 15 minutes, the teacher writes $21 + 15$ on the chalkboard (b) distractions were more prevalent during lesson one and out-of-seat behavior occurred more often in lesson one e.g., Paul one of the exposed children walks over and pushes Reggie on the floor, Michael interrupts the teacher four times, Nolan purposely snatches and tears another students paper, Carl crawls under a table and refuses to do math problems, Ricky one of the children exposed asks the teacher aide to complete math sheet, the teacher aide asks the student to wait a moment while attempting to help

another student, the student responds by hastily running out of the classroom and down the hall (c) lessons were interrupted more often by small incidences of fights in lesson one e.g., during lesson one Jack takes another students toy, the teacher stops the lesson and intervenes, the toy has to be physically removed from the student's hand by the teacher--total interruption time 10 minutes, Peter one of the nonexposed students in the study is sent to the time out corner for yelling at another student (d) the number line method was discernible on both days to solve math problems e.g., the teacher writes a 2-digit problem with renaming on the chalkboard, Michael is called by the teacher to solve the problem, Michael carries and refers to a 12 inch ruler to assist with solving the problem (e) student's responses occurred more often during lesson one e.g., during lesson one the teacher writes a 2-digit addition problem on the chalkboard with renaming, then calls Michael to solve the problem, Keith and Jim both raise hands to solve the problem, Wilford responds with the correct answer out-of-turn, indicatess Michael takes to long to answer the problem, Tom also yells the answer aloud (f) during both lessons students were quiet and willing to attend to task e.g., students that worked in large groups sat quietly and completed all problems on the worksheets, noise or distractions were not noticeable (g) lesson two was on average more calm than lesson one, fewer distractions were noted e.g., during lesson two, students were observed sitting quietly and completing task for at least 15 of the 20 minutes allowed for math instruction,

the teacher was able to move from problem to problem with fewer distractions, a total of five of the six children in large group activity were able to solve problems for each turn when called by name.

Students in the study showed no observable differences in learning/behaviors during math instruction. The two students exposed solved as many problems correctly as the nonexposed students. There were several opportunities to observe the students exposed and nonexposed. The following was observed: the two nonexposed students were off task for a longer period of time than the two students exposed. Both of the students in the study exposed to crack\cocaine are according to the teacher impulsive, hyperactive and show similarities in patterns of behavior. The teacher describes one of the students exposed as having problems with self-control but after a bad morning is able to calm down. On the otherhand, another student exposed believes the entire day has been wasted and spends the rest of the day displaying inappropriate behavior.

The students were conscious of teacher stance. When the teacher moved in the direction of the math workbooks, the students passed our workbooks, aligned desk, and distributed manipulative. The students then sat waiting for teacher direction lesson.

The teacher feels the children exposed to crack\cocaine are on average more hyperactive than the children nonexposed. One of the exposed children's behavior deteriorated to the point the

student was placed on half day attendance. Still another student in the study showed periods of outburst and temper tantrums. These outbursts were noted when the student had not taken prescribed medication.

Of particular interest is the students interest in math. The teacher was struck with the students high level of interest and level of achievement in math. The students approach the teacher several times during the day for additional math worksheets. In examining the students math worksheets, most of the math problems were solved correctly.

In summary, the results of this study indicate there were no observable differences in the learning/behavior patterns of children exposed or not exposed to drugs during math lessons.

DISCUSSION

The students in this school were orderly and observed school rules. Teachers were visible throughout the building and were eager to attend to students' needs. Many of the teachers carried tokens that were passed out to students walking to and from classes in an orderly manner. Tokens could be traded at a weekly fun fair for a choice of prizes. Resource staff and teacher cooperation was recognizable throughout the school. Signs displaying school rules were visibly posted and students were conscious of school rules. The principal's presence was noticeable within the school. On several occasions the principal visited classrooms, assisted with school projects, discipline problems or other school activities. School busses arrived on

time each morning and afternoon. The children were generally organized while leaving the school premises.

Students experiencing off task behavior by exhibiting temper tantrums or throwing objects are physically restrained by the teacher. During a restraining period the teacher exerts a composed and consistent position. The teacher's voice never raised to a point of shouting at the students. Encouraging remarks are used as reminders to the students of appropriate behavior.

Interestingly, (Cole et al.,1990) consider some of the basic assumptions when working with children exposed to drugs; prenatal drug exposure can cause a continuum of impairments from severe handicapping conditions to risk factors, children show a pattern of performance that is often inconsistent and unpredictable; they "sporastically" master skills, behaviors seen are the result of a constellation of risk factors resulting from possible organic damage, early insecure attachment patterns, and often ongoing environmental instability.

These findings are indeed limited, it remains for further study if, in fact, children exposed to crack/cocaine at birth will experience learning disabilities. In addition to generalizations that children will experience problems in the classroom, additional investigations regarding the practicality of these generalizations might focus on teacher preparation programs when addressing the needs of at risk children. More specifically, implementing a developmental framework of learning

is an essential component to providing support and emotional reassurance to students.

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